

REMARKS

Claims 1, 3-11, and 13-18 were finally rejected in the last Office Action. This paper is a response to the Final Office Action.

Claims 1, 3-11, and 13-18 stand rejected under 35 U.S.C. §103 (a) as being unpatentable over Biing-Jye et al. in view of Haitz et al. Regarding Claim 1, the Examiner states:

Haitz et al. discloses in Fig.1 and column 3 lines 16-28 a multi-layer contact having a reflectivity greater than 75% for light at an operating wavelength of a light emitting device. It would have been obvious to one of ordinary skill in the art to use the reflectivity of greater than 75% of Haitz et al. in the light emitting device of Biing-Jye et al. in order to decrease photons absorption as taught by Haitz et al. in column 2, lines 5-8. (Office Action, section five).

The rejection is traversed on the grounds that the combination of references does not teach each and every element of the claimed invention. A feature of the present invention, as recited in Claim 1, as amended, is “a multi-layer contact...that makes ohmic contact through a uniform conducting sheet to the heterostructure; and wherein the multi-layer contact has a reflectivity greater than 75%” (emphasis added). Support for the amended claim can be found, for example, on page 2, lines 24-30, “The low conductivity semiconductor cannot spread current efficiently from the patterned contact...For low conductivity semiconductor devices, the ohmic contact needs to be a uniform sheet,” and in Figs. 1 and 3. Hence, the advantage of this structure is clearly set forth.

The reference relied upon by the Examiner to teach the reflectivity greater than 75% uses a non-uniform film, patterned by “using a laser to create small alloyed dots...Typically, only 1% of the bottom surface is formed into contacts, leaving 99% of the bottom surface to serve as a reflecting surface.” Therefore the contact in Haitz et al. is not a “multi-layer contact...that makes ohmic contact through a uniform conducting sheet” and does not meet Claim 1.

Hence even the combination of references fails to teach each and every element of the invention, and so the §103 rejection is prima facie unfounded, and should be withdrawn, as applied to amended Claim 1.

Claims 4, and 8-10 depend directly or indirectly from independent Claim 1, and are therefore patentable over Biing-Jye et al. in view of Haitz et al.

Claim 11 is rejected under 35 U.S.C. §103(a) as being unpatentable over Biing-Jye et al. in view of Haitz et al. However, Claim 11, as amended, is directed to a similar feature as

Claim 1: "a multi-layer contact...that makes ohmic contact through a uniform conducting sheet" Therefore, Claim 11 is patentable for at least the same reason as Claim 1, that the combination of Haitz et al. with Biing-Jye et al. does not yield the combination of features recited in Claim 11.

Claim 14 depends directly from Claim 11, and is therefore patentable over Biing-Jye et al. and Haitz et al.

The Examiner made the following rejections under 35 U.S.C. §103(a): Claims 3 and 13 as unpatentable over Biing-Jye et al. and Haitz et al. in view of Sugiura et al., Claims 5 and 15 as unpatentable over Biing-Jye et al. and Haitz et al. in view of Nakagawa et al., Claims 6 and 16 as unpatentable over Biing-Jye et al. and Haitz et al. in view of Liu et al., Claims 7 and 17 as unpatentable over Biing-Jye et al. and Haitz et al. in view of Schetzina, and Claim 18 as unpatentable over Biing-Jye et al. and Haitz et al. in view of Okazaki.

None of Sugiura et al., Nakagawa et al., Liu et al., Schetzina, or Okazaki remedy the defects of Biing-Jye et al. and Haitz et al. with respect to the patentability of Claims 1 and 11. Consequently, Claims 1 and 11 are patentable over Biing-Jye et al. and Haitz et al. in view of any of these references. Claims 3, 5, 6 and 7 are patentable over the cited combinations of references as a result of their dependence on Claim 1. Claims 13, 15, 16, 17 and 18 are patentable over the cited combinations of references at least as a result of their dependence on Claim 11.

For the above reasons, Applicants respectfully request reconsideration and allowance of Claims 1, 3-11 and 13-18, all pending. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 453-9200.

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Respectfully submitted,



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Appendix A

The following identifies the changes that the present submission makes to claims 1 and 11 in U.S. Patent Application Serial No. 09/469,652.

1. (Three times amended) A light-emitting device comprising:

a semiconductor heterostructure including at least one p-type layer and one n-type layer;

a p contact and an n contact, the p contact electrically connected to the p-type layer, the n contact electrically connected to the n-type layer, wherein at least one of the p and n contacts is a multi-layer contact external to the semiconductor heterostructure and including a metallic reflector layer and a continuous conductive layer that makes ohmic contact through a uniform conducting sheet to the heterostructure; and

wherein the multi-layer contact has a reflectivity greater than 75% for light at an operating wavelength of the light-emitting device.

11. (Three times amended) A light-emitting semiconductor device comprising:

a GaN-based semiconductor heterostructure having at least one p-type and one n-type layer;

a p contact and an n contact, the p contact electrically connected to the p-type layer, the n contact electrically connected to the n-type layer, wherein at least one of the p and n contacts is a multi-layer contact external to the semiconductor heterostructure and including a metallic reflector layer and a continuous conductive layer that makes ohmic contact through a uniform conducting sheet to the heterostructure; and

wherein the multi-layer contact has a reflectivity greater than 75% for light at an operating wavelength of the light-emitting device.